



# *Stiletto / Wolf PAC*



Office of Force Transformation

*The small...*

*The fast...*

*and the many....*

**Technical Exploration**  
**Operational Experimentation**  
**Industrial Expansion**

*CAPT Neil Parrott, USN*  
*Office of the Secretary of Defense*  
*Office of Force Transformation*  
*Neil.Parrott@osd.mil*  
*703-696-5874*

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# Assuring U.S. Security

## *...OFT's Objectives*



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- **The U.S. must have access to remote but populous regions of the globe to guarantee our freedom.**
  - *U.S. Security is not assured by protecting only our Nation's borders.*  
*Secure strategic access and retain global freedom of action.*  
*Donald H. Rumsfeld, National Defense Strategy, 01 March 2005*
- 1. That security requires development of smaller, faster, more adaptive vessels for effective engagement of an allusive adversary.**
- 2. Making these systems work will require a new operational and technological Command & Control approach to warfare.**
- 3. Most importantly, To develop these new, reconfigurable vessels and forces requires an industrial base able to produce them.**



# Increase Learning Rates



*Mitigate risk w/ numbers, decrease time to market*

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- ***Technical Exploration*** – *new materials & hull forms*
  - *Broaden seaborne options and capabilities*
  - Reduce crew injury
    - *Improve ride quality*
  - Lower operating costs
    - *Operational & Commercial Viability w/ composite materials*
  - Increase high-speed performance and payload fraction
  - Decrease draft / wake & fully characterize performance
  - Explore new methods of production with composite materials
  - Create new analytic tools to evaluate, validate & improve designs
    - *Generate useful Computational (CFD) models to advance new designs*



# Assure Access to the Littoral

## *Operational Maneuver from the Sea*



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- ***Operational Experimentation*** – *employment options from the Sea*
  - ***Dedicated*** to Distributed Naval Forces and USSOCOM *for...*
    - ***Mobility*** – *High Speed / high payload fraction / low draft-wake-signature*
    - ***Insertion*** – *In close engagement, greater speed of maneuver*
    - ***Sustainment*** – *Organic supply and local control at relevant scale*
  - ***Reconfigurable*** for changing roles & dynamic conditions
    - *Disaster Relief / Humanitarian Assistance (Katrina / Indonesia)?*
  - ***Executable*** example of a strategic approach to cost for DoD
    - *Reduced cost and time – pairing new CONOPS with technologies*
    - *Compete at scale – fill every niche – cost imposing strategy on adversaries*





# National Competitive Advantage

## *Coherent Strategy for Shipbuilding*



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- ***Industrial Expansion*** – *New competencies / Commercial relevance*
  - **Expand the Industrial Base** – *new materials, production and manufacturing methods*
    - *Catalyze public – private partnerships*: between Government, Industry and Academic
    - *Team with diverse partners and leverage advances abroad*: U.S. is no longer a leader
  - **Advance Distributed Logistical Capabilities** – *Dual-Use Short Sea Shipping assets*
    - *Develop, design & produce modular, lightweight, high-speed composite vessels*
  - **Create American Global Competence** – *incentives for a competitive industrial base*
    - *Build high numbers of composite surrogates in DoD* – *Lowers commercial and financial risk*
    - *Invest in education* – *Retain young government talent by funding MS and PhDs degrees*
    - *Reinvigorate R&D* – *design advanced hull forms with complex composite materials*
    - *Evolve the “Electronic Keel”* – *for commercial and multi-use modular vessels*



# Stiletto / Wolf PAC



## *Concept to Operational Capability in 18 Months*

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- ***Stiletto*** – High-Speed, Carbon Reinforced Fiber Craft
  - *Designed to explore the scalability of non-mechanical dynamic lift, composite construction and high-speed performance for military operations*
  - *Not meant to replace or compete with capital ships of the line, Intended to create capital potential in every networked hull*
- ***Wolf PAC*** – Command & Control of Distributed Operations
  - *Technological and operational means to command & control large numbers of networked unmanned systems (>50) geographically dispersed*
- ***Electronic Keel*** – Maritime Data Bus
  - *Facilitate rapid mission/payload reconfiguration necessary for SOF-like forces to deploy, modify and tailor capabilities to emerging challenges*

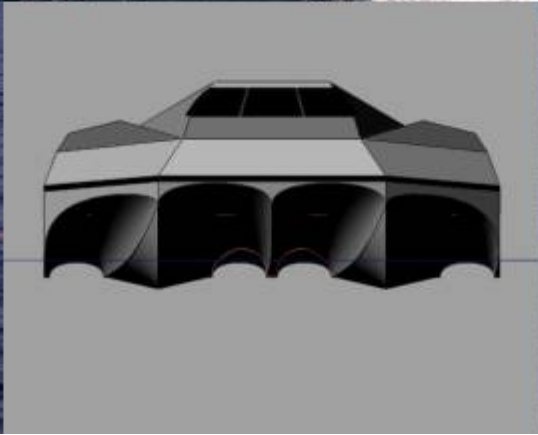


# *Stiletto (M-Ship Co)*

## *...Surrogate for Change*



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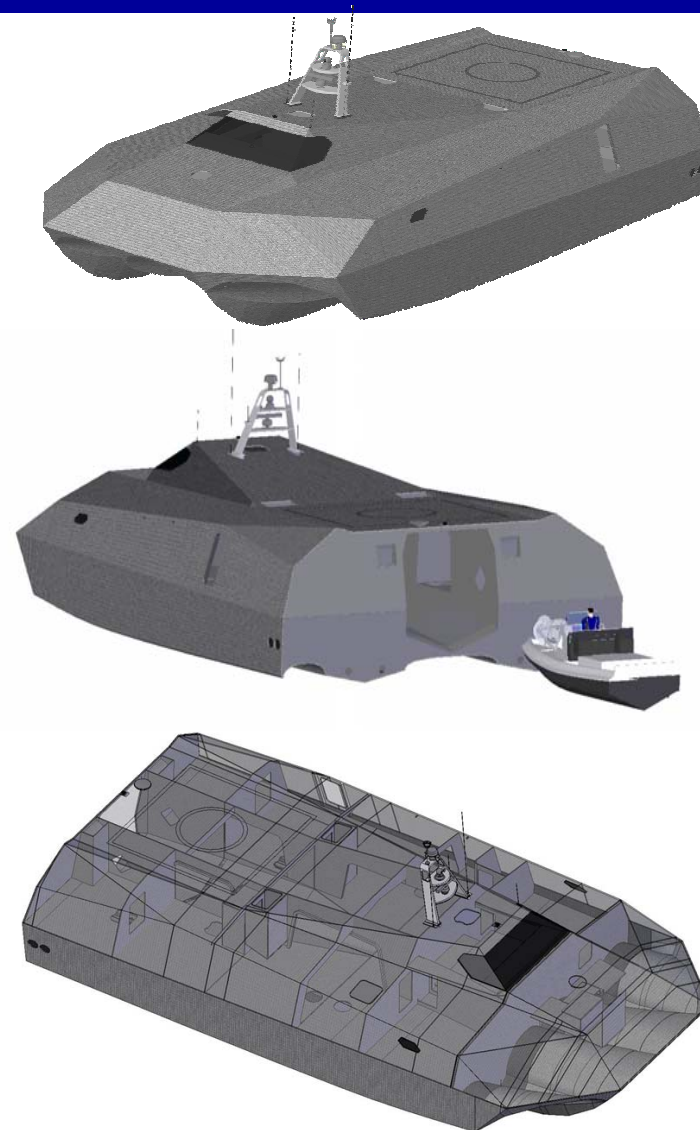
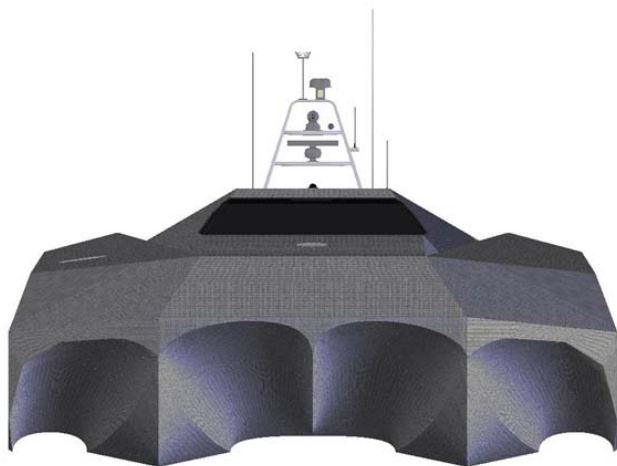
# Stiletto



## ...Technical Objectives

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- Dimensions: 88.6 x 40 ft / Draft 2.5 ft
- Manning: 15 (3 Crew / 12 Passengers w/ SPECWAR Load out)
- Displacement: 60 LT Full Load / 67 LT Max load
- Payload: Cargo - 15 MT / Fuel - 16 MT / Area - 2000 sq ft
- Max Speed: 50-55 kts - SS0 / Cruise Speed 40 kts - SS4
- Range: 500 nm @ full load / max speed
- Reduced crew shock (30-50%) / Improved Sea keeping
- Carbon Reinforced Fiber construction (largest US built)
- 11m RHIB launch & retrieval (up to SS3)
- UAV / USV / UUV launch, retrieval & C2
- Reduced Wake & Drag / Non Mechanical Dynamic Lift Hull
- Networked node for austere environments / disaster relief





# Stiletto

*...Under Construction*



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**M Ship Co.**

LOA	88'-0"
Beam	40'-0"
Draft (static)	2'-4"
Displacement	60 LT
Payload	15 MT
Fuel Load	17 MT
Classification	ABS
Main Engines	4 x 1650HP C-30 CAT
Surface Piercing Propellers	4
Speed Max @ full load	50-55 knots
Range @ full load & max speed	500 NM
HP Total	6200hp
Clear Height	15'-0"
Payloads	43% of Displacement
	11-M RIB or equivalent
	UAV / UUV / USV
	15 personnel (3 Crew / 12 Passengers)







# *Stiletto*

## *...SPRINT Panel Construction*



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# *Stiletto*

## *...Bulkheads & Internal Structure*

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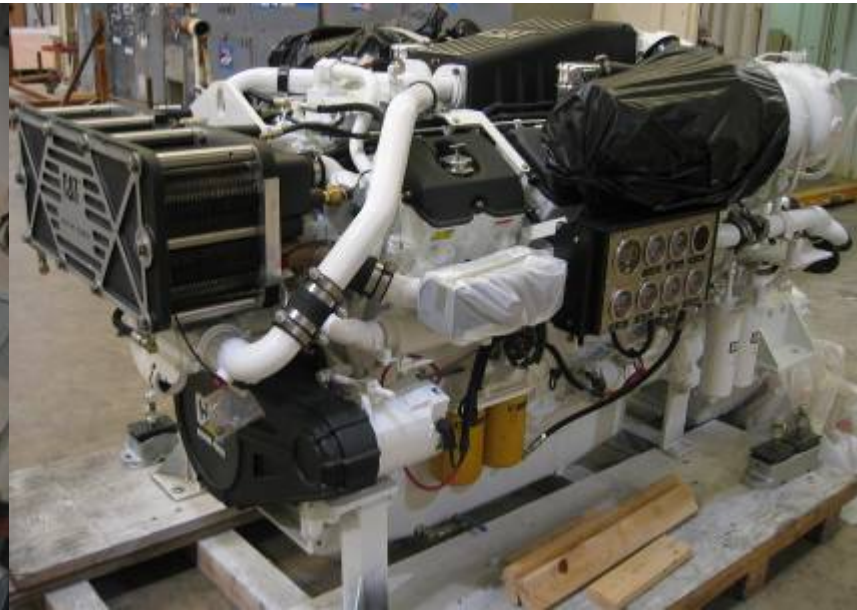


# *Stiletto*



## *...Engine Room x 4*

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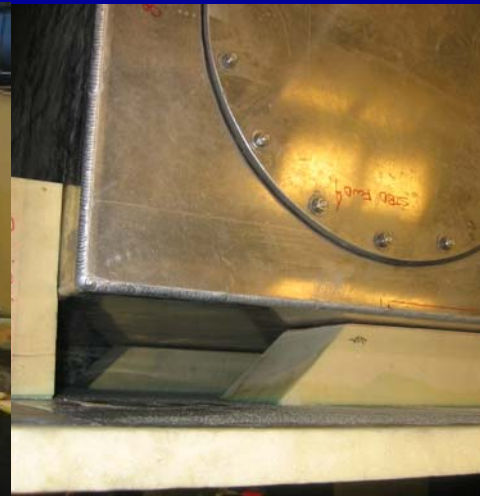


# *Stiletto*

## *...Fuel Tank Installation*



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## ...Arneson Surface Drives



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# *Stiletto*

## *...Superstructure*



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# Stiletto



## ...Superstructure

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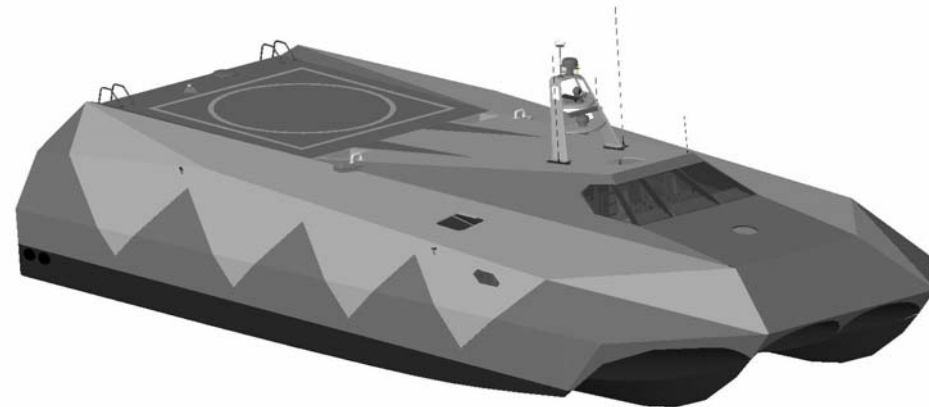
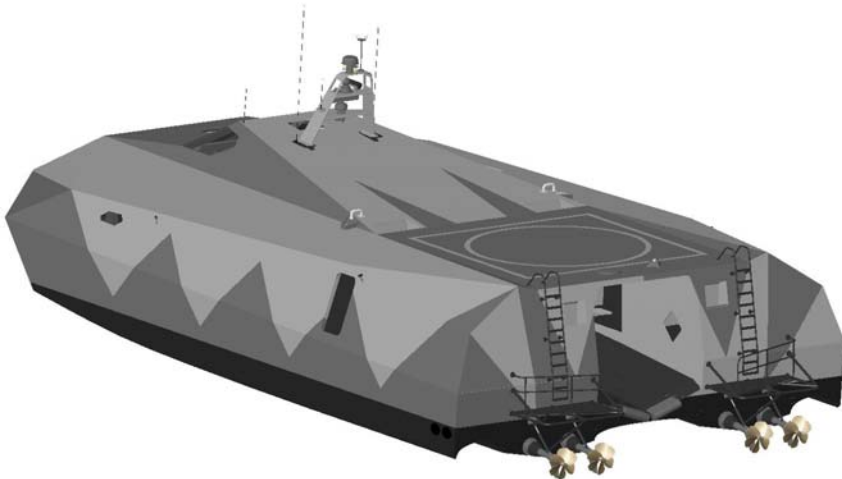
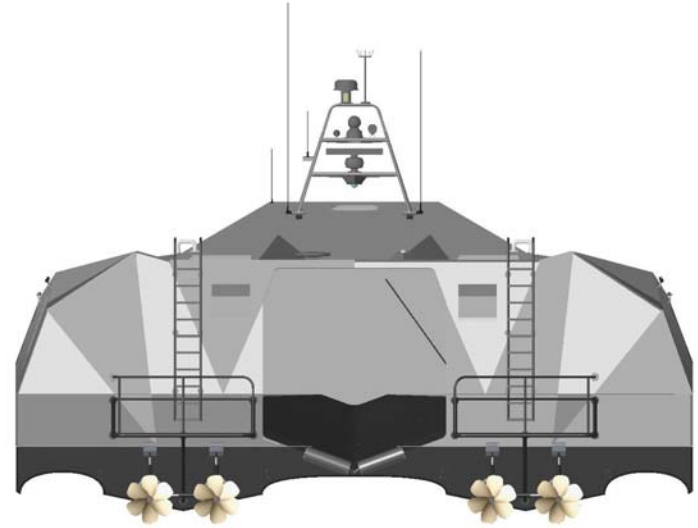
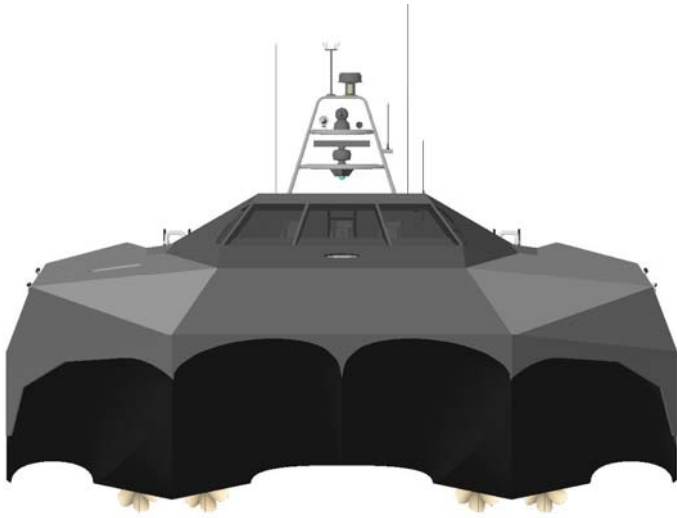


# *Stiletto*



## *...Profiles*

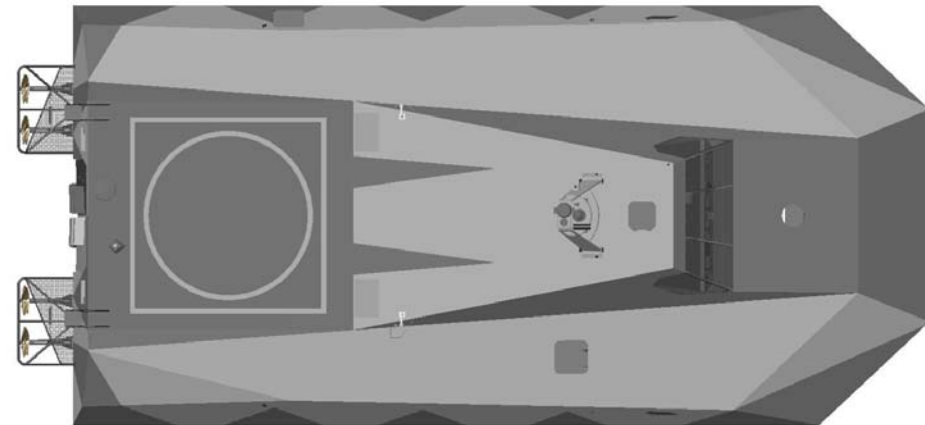
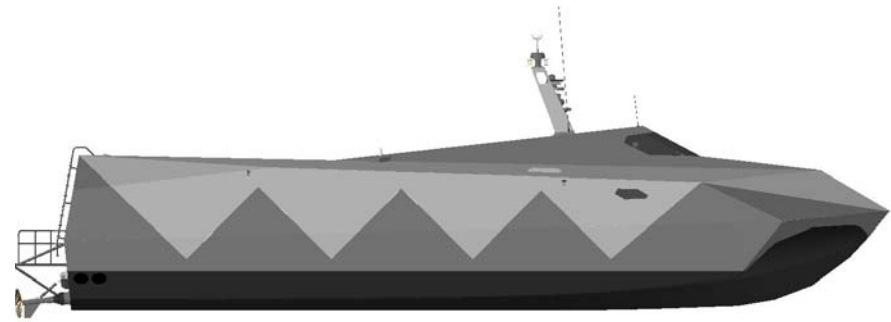
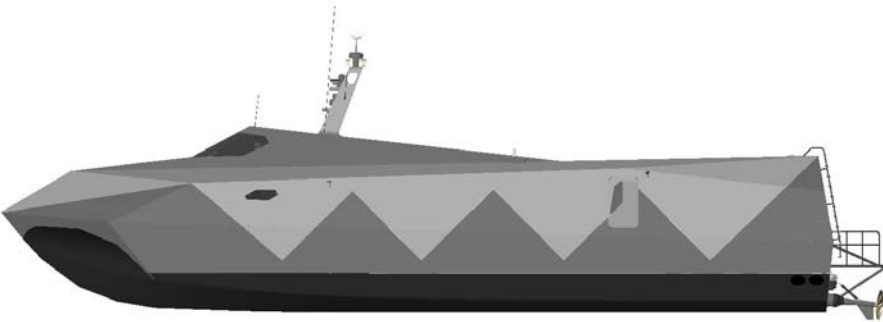
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# *Stiletto*

## *...Profiles*





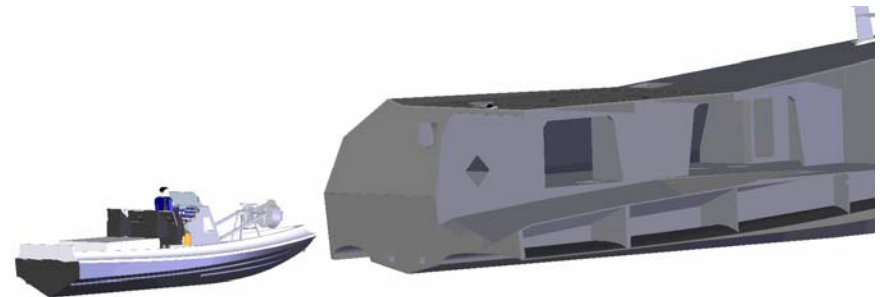
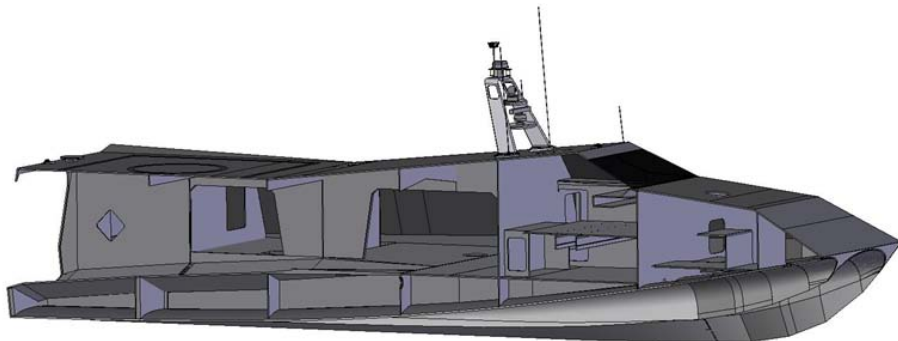
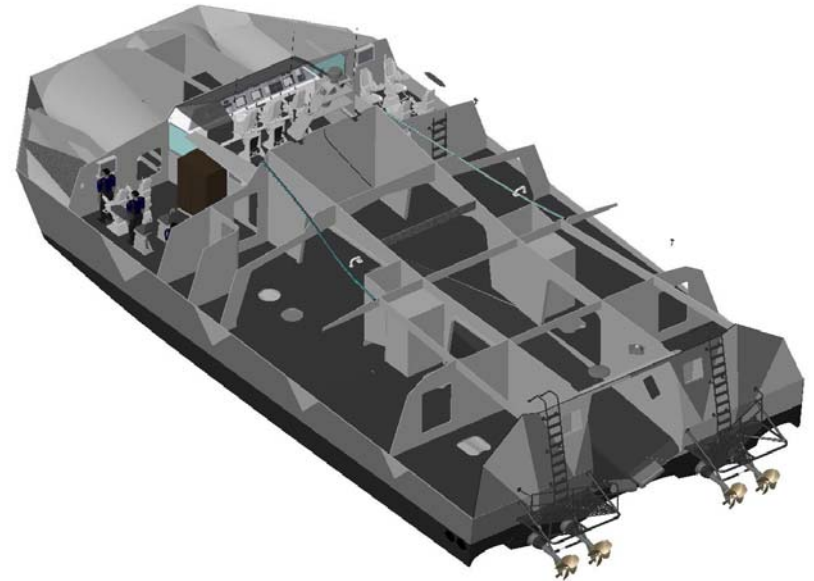
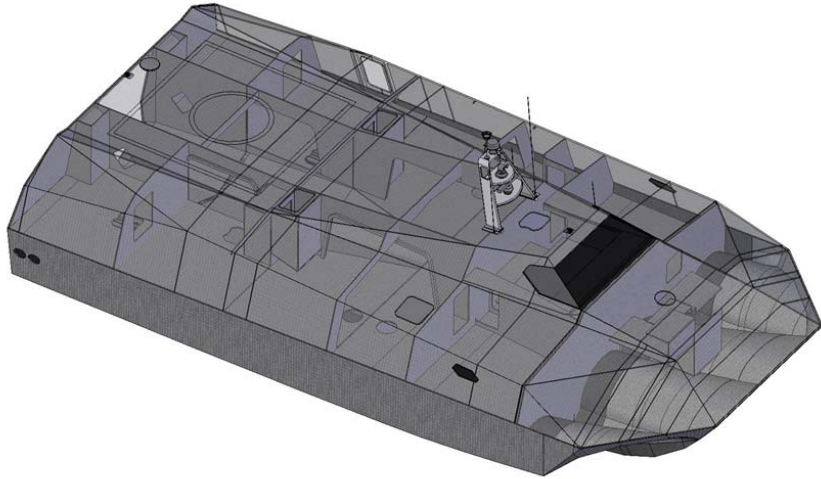


# Stiletto



## ...Sectional Views

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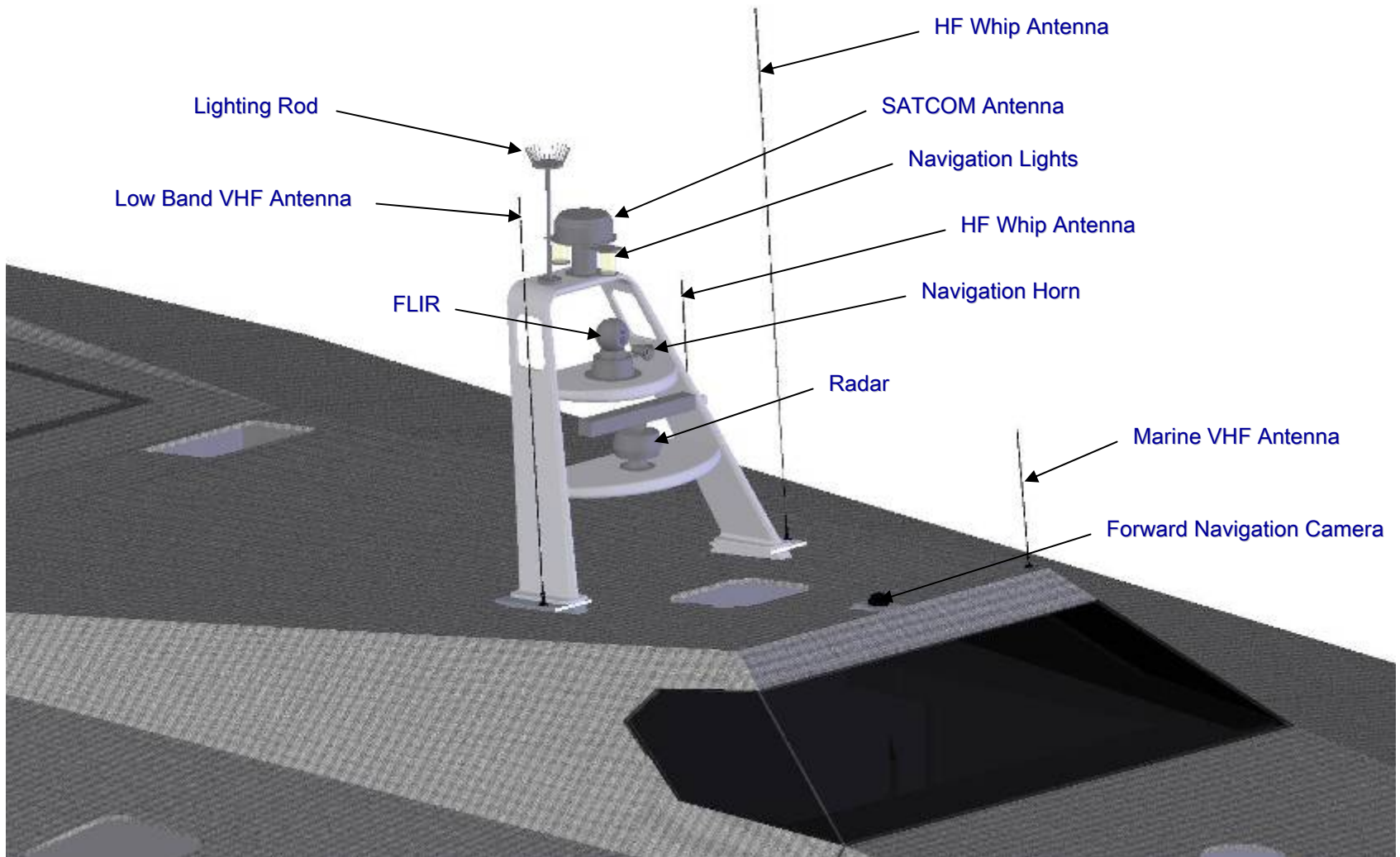


# Stiletto

## ...ISR Assets



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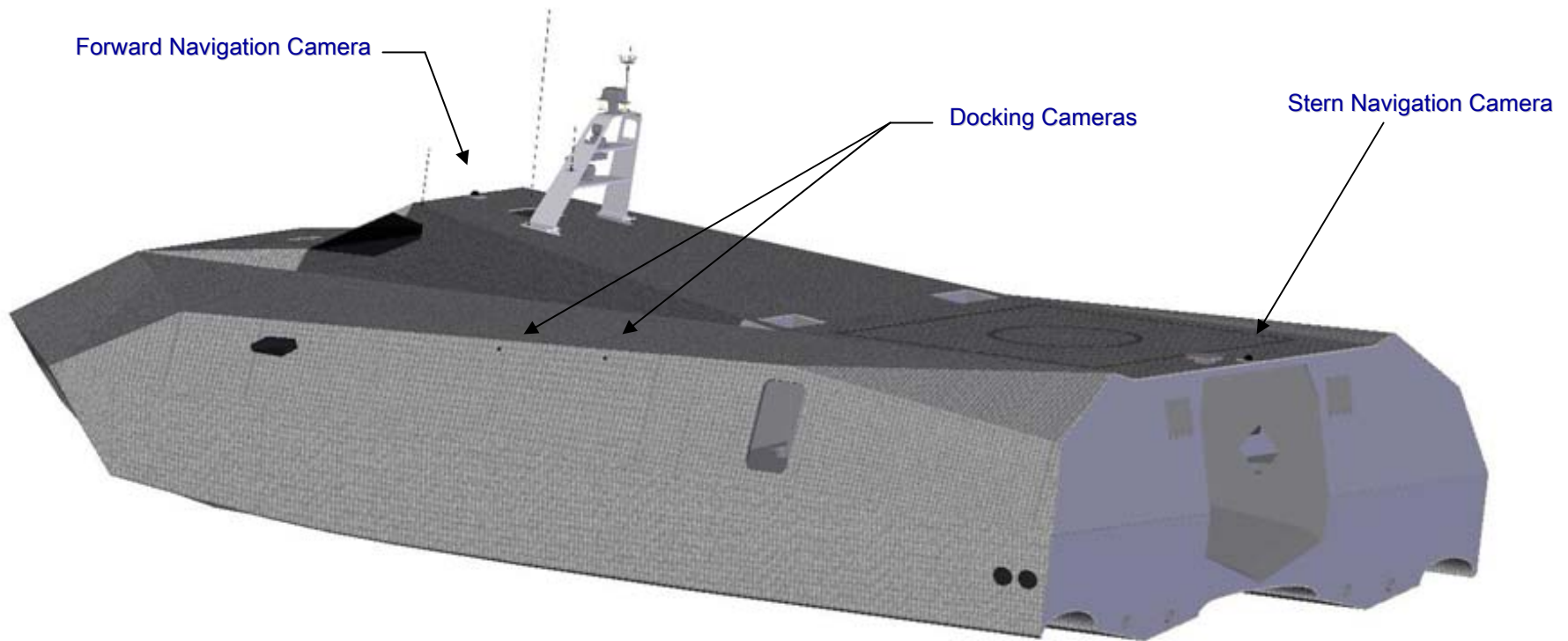


# Stiletto

## ...ISR Assets



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\*\*\* Note: Additional Camera In Payload Area Looking Out Stern

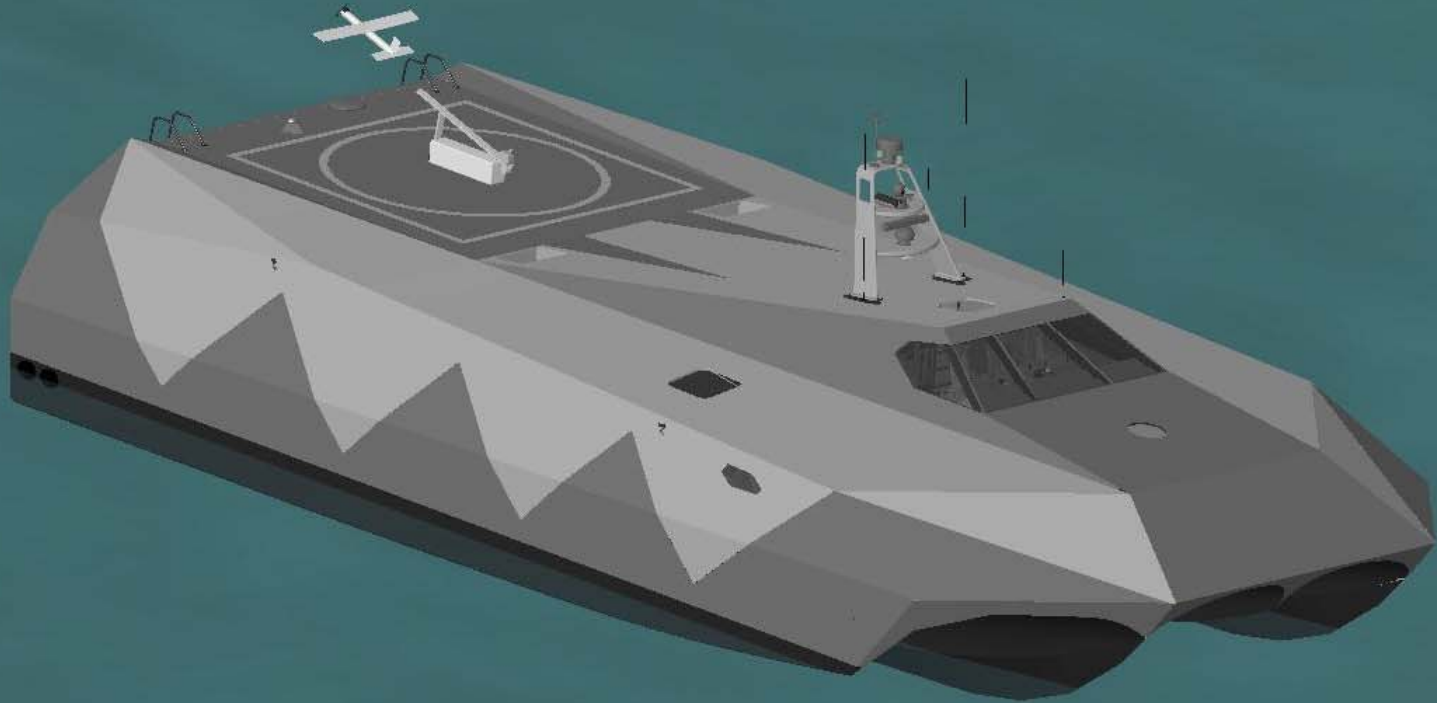


# *Stiletto*

## *...UAV Launch & Retrieval*



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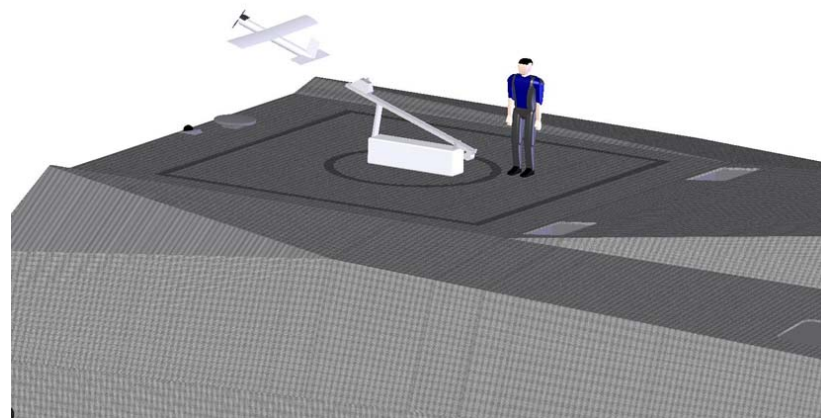
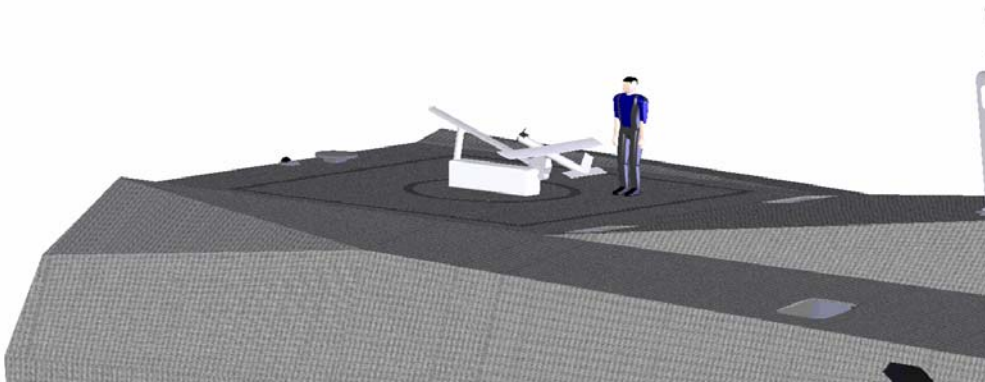
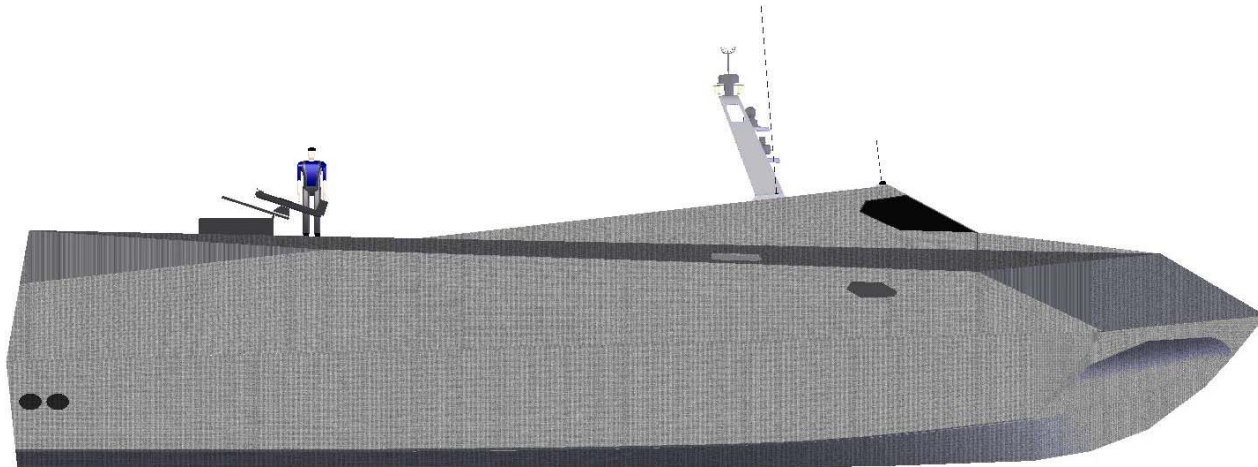


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## *...UAV Launch & Retrieval*



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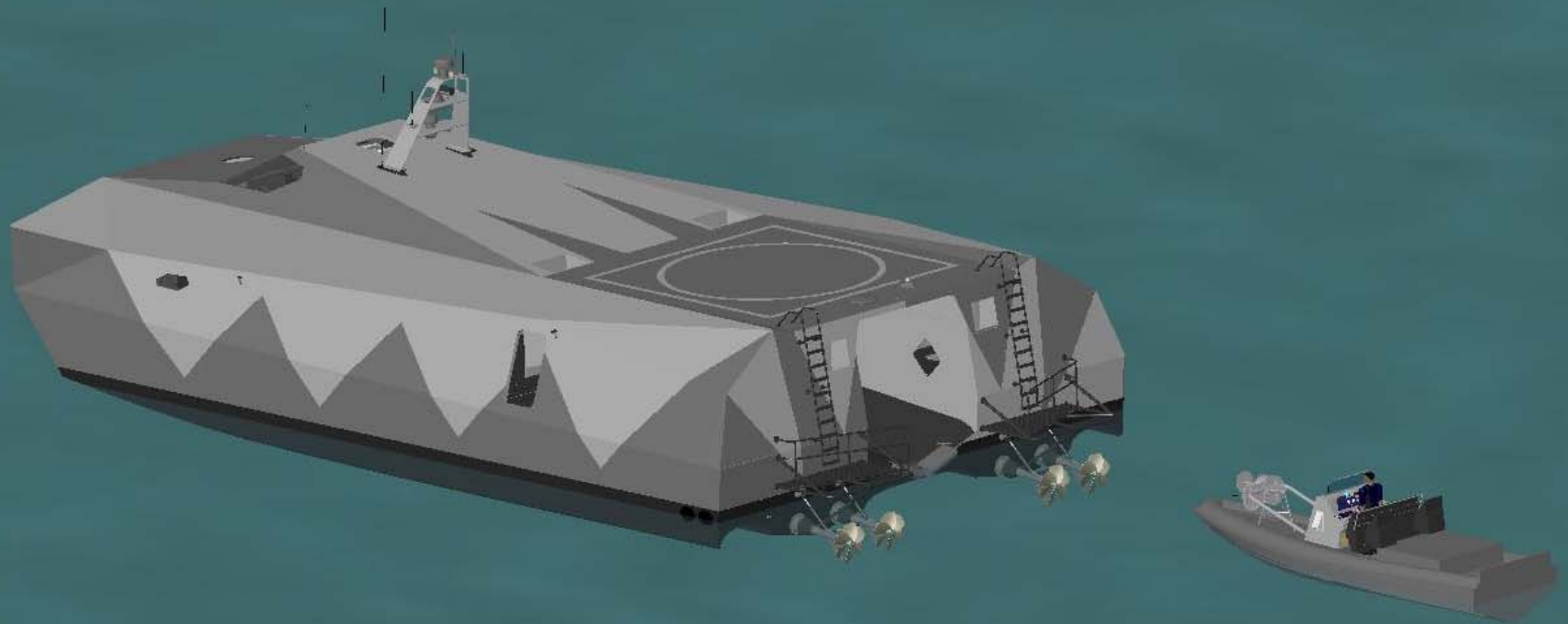




# *Stiletto*

## *...11M RHIB Launch & Retrieval*

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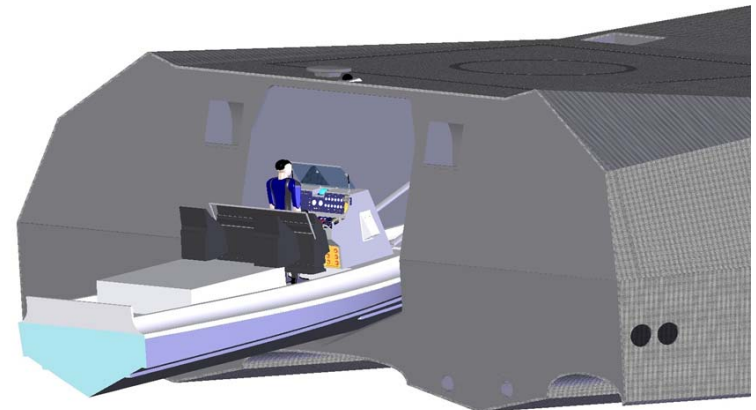
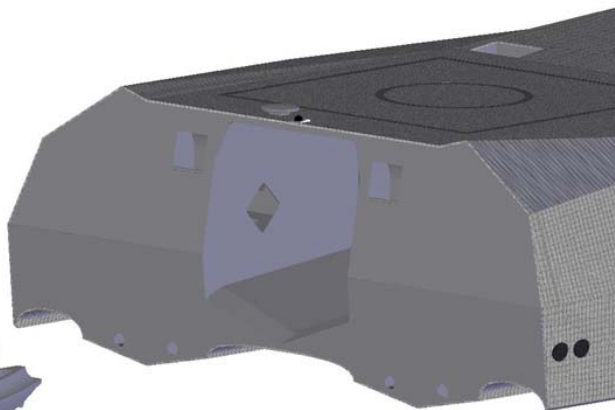
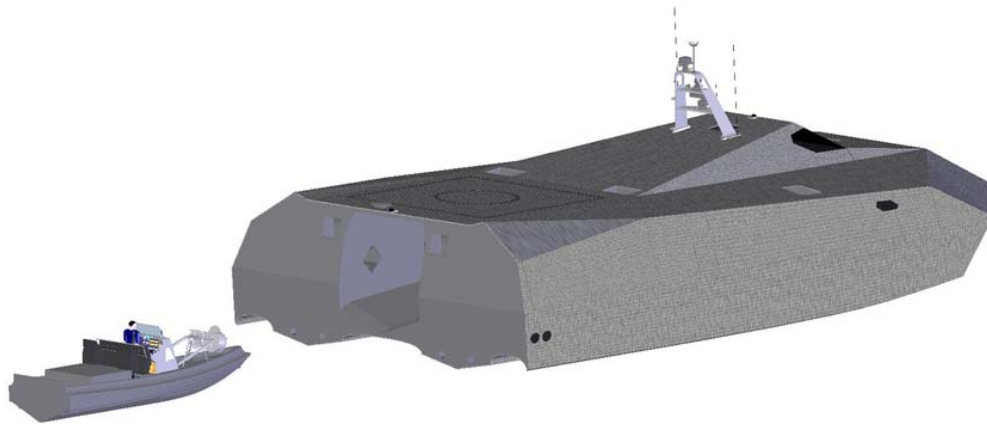


# *Stiletto*

## *...11M RHIB Launch & Retrieval*



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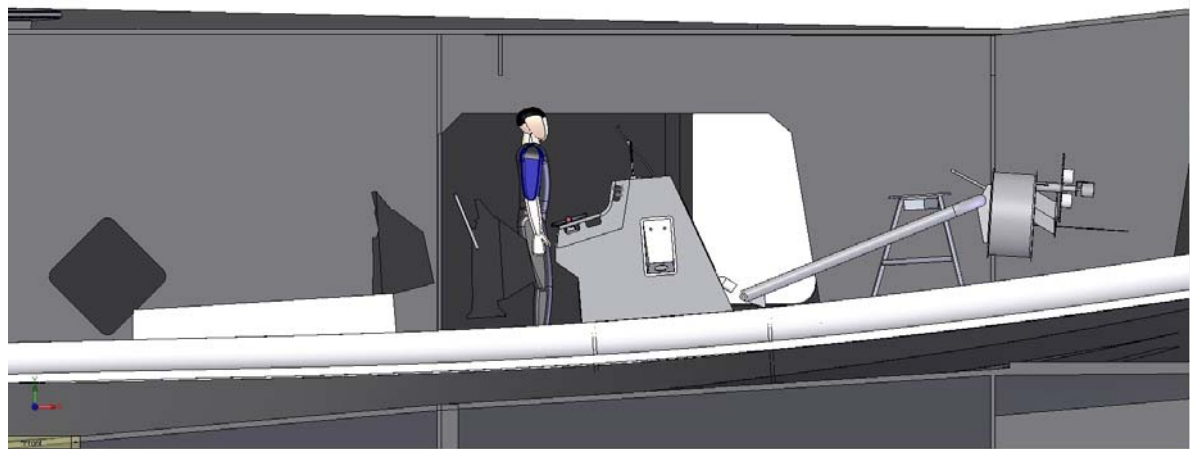
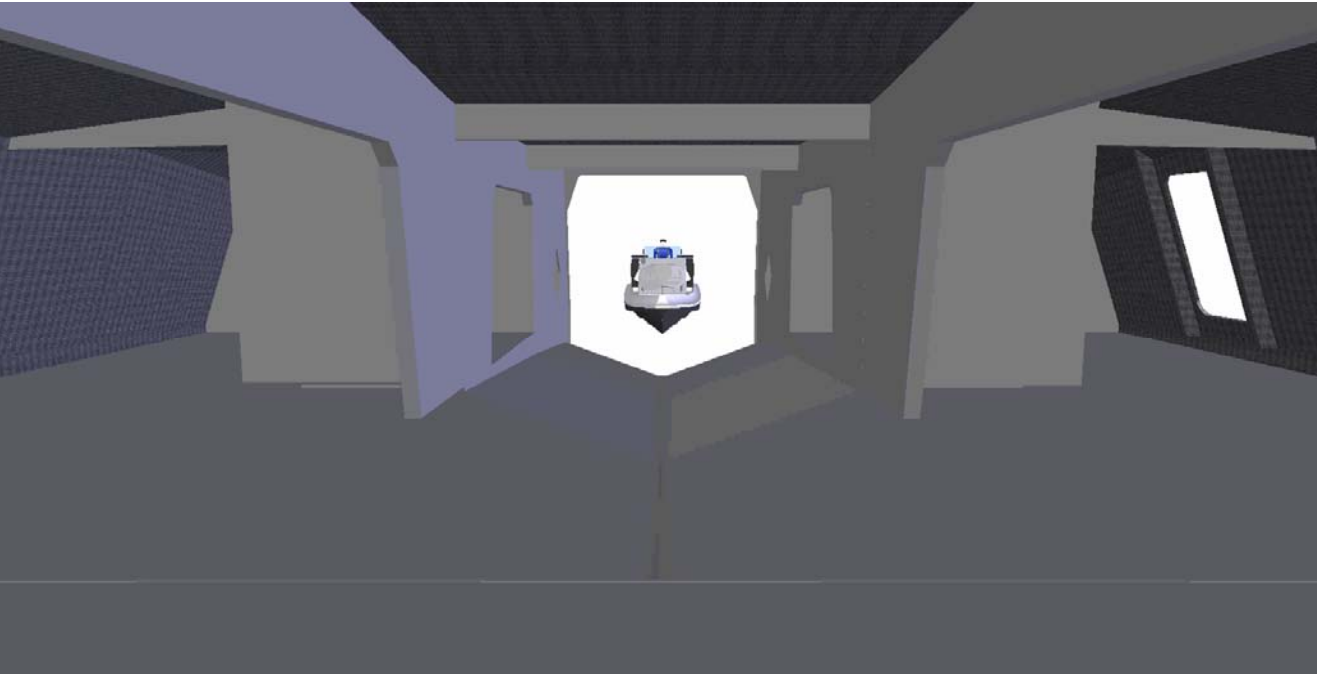


# *Stiletto*

*...11M RHIB Retrieval*



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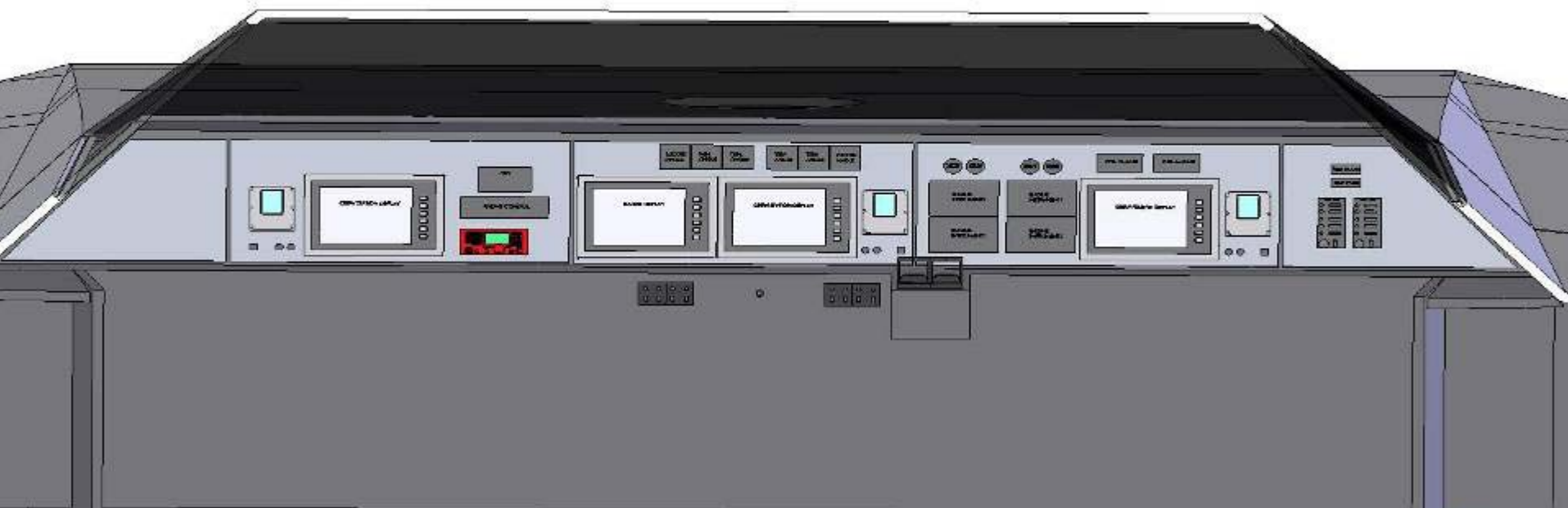
# Stiletto



## ...Crew Cockpit

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- **TACAIR functionality on the sea surface** - *Fully Networked Interfaces*
  - **Discriminate & Decide** *with locally controlled tactical components*
  - **Command & Control** *distributed autonomous systems*
  - **Task & Direct** *operational assets and sensors*







# *Electronic Keel*

*...Maritime Data Bus*



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**Genuine modularity:** *Flexible architecture to accommodate change...*  
*Common standards, interfaces and protocols to decrease cost...*

- **Craft Systems monitoring**
  - Fuel Tank levels
  - Power generation (Voltage and Current)
  - Bilge Pumps & Flooding Alarms
  - Fire Suppression systems
  - Engine Alarms
- **Navigation & Digital Charting**
  - Electronic charts
  - Radar Overlay
- **Sensor Systems**
  - GPS, depth sounder, heading
- **Intercom/Communications**
  - Voice & data
  - HF/VHF/UHF/SATCOM/ITT Mesh/SIPNET
  - SeaBased networked HUB/Node/Link
- **Video Acquisition**
  - **Capture, stow and frame grab**
    - FLIR (IR and Low Light)
    - Low Light Cameras
- **Situational Awareness**
  - Open Source Software (DOD controlled)
- **Processing Power**
  - Cluster Supercomputing
  - Memory (plenty)
- **Command & Control**
  - **Manned & Unmanned Assets**
    - Off Board Sensors – Hyper/SSS/Video
    - Mission Planning (HVAC / Networked)
    - Sockets (plug and play carry-on)
    - Common Operating Displays



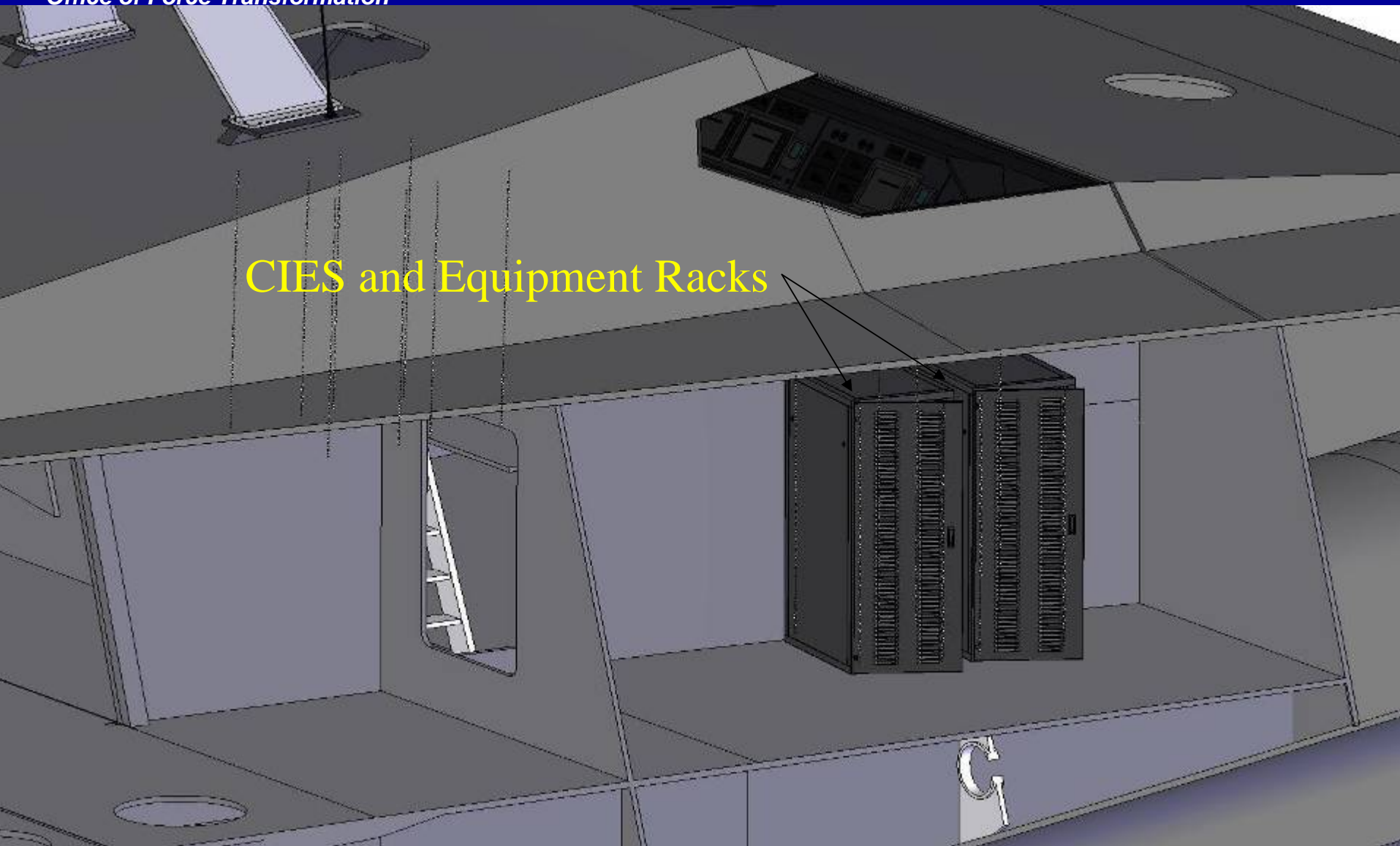
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*... Electronic Keel - 1 GB LAN*



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CIES and Equipment Racks







# *Stiletto*

## *...Testing - Envelope Management*



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- **Technical Utility:** *Craft evaluation will include the following...*
  - ✓ **Calm Water Naval Architecture Trials**
  - ✓ **Rough Water Naval Architecture Trials**
  - ✓ **Maintenance, Reliability, Sustainability Studies**
  - ✓ **Accessibility, Design Space, Ergonomics Studies**
  - ✓ **Development of Computational Models**
  - ✓ **Comparisons with Model Testing**
  - ✓ **Scalability of Design**



# *Stiletto*

## *...Operational Experimentation*



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- **Operational Utility:** *Craft Operational Experimentation will include...*
  - ✓ with NSWG TWO, NSWG FOUR, DEVGRU, NSCT-1
  - ✓ with USCG (DHS) (Maritime Interdiction Operations)
  - ✓ 11m RHIB & CRRC Operations (Launch & Retrieve)
  - ✓ Unmanned Vehicles Operations (UAV / USSV / UUV)
  - ✓ Disaster Relief / Austere Environment support
    - Communications HUB / Network Node
  - ✓ Surrogate test platform for...
    - *emerging technology,*
    - *networked assets and*
    - *operational concept development*





# *Stiletto*

## *...Schedule of Events*



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### **Current schedule:**

- **Operational Outfitting:** *January 2006*
- **Craft Acceptance:** *April 2006*
- **Naval Architecture Trials:** *March – April 2006*
- **First Operational Experiment:** *May 2006*
- **Craft Transfer to East Coast:** *Summer 2006*
- **Computational Modeling:** *Aug 06 – December 07*
- **Equipment Experimentation:** *May 06 – December 08*
- **NSW Experimentation:** *Aug 06 – TBD*



# *Stiletto*

## *...USSOCOM R&D Partnership*



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### *Included in exploration*

- M Hull availability
- Mission Reconfigurable
- Open Payload Space
- Open Deck Space
- Flexible Electronic Keel
- Networked Comms
- Super Computer
- SIPRNET Connectivity
- 11 M RHIB
- Experimentation Funding

### *Future Equipment Options*

- Additional Comm Gear
- Mission Specific Equipment
- Weapons
- Dedicated UAV / USV
- Additional Sensors





# *Stiletto*

## *...Technical Support*

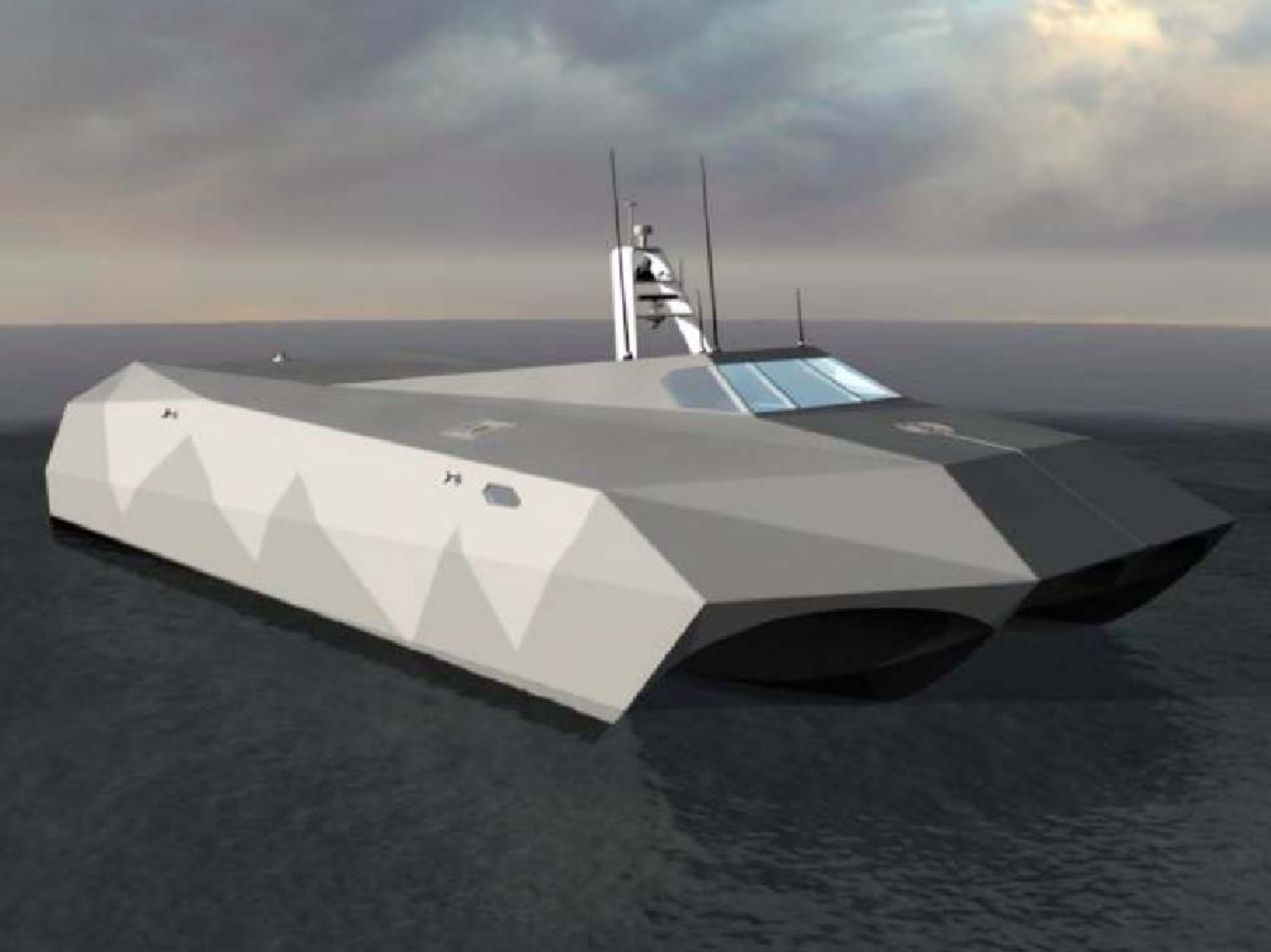


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**NSWCCD providing the following support:**

- **Contracting Agent / Documentation**
- **Design review**
- **Construction review / oversight**
- **Risk assessment for Sponsor**
- **Test plan development**
- **Experimentation planning**
- **Operational equipment installation**













# *Stiletto*











